

CLAIMS 63623 US

1. Sample processing system for a plasma spectrometer for analysing viscous samples and sample insoluble at room temperature, comprising :

a tray with tubes containing the sample,

5 a heating block comprising a thermoregulation switch,

means for collecting the sample from tubes, said means being connected to a transfer tube,

the said transfer tube having a length L and a diameter d inside which said sample is pumped down by a peristaltic pump, the said pump being  
10 controlled by a controller box and comprising a first pump tubing of internal diameter  $\phi$  and a second pump tubing of internal diameter  $\phi'$ ,

a sample introduction system fed by to the peristaltic pump and containing a nebulizer and a spray chamber,

wherein

15 said sample processing system is thermoregulated.

2. Sample processing system according to claim 1, wherein the system comprises :

heating means for heating the system,

control sensors for measuring the temperature of the system at various  
20 locations,

control means for regulating the temperature of the heating means within a predetermined temperature range, and

insulating means to lag the system.

3. Sample processing system according to claim 2, wherein the heating  
25 means comprise a heating wire wound around the transfer tube and the top of the means for collecting the sample from the tubes, a heating fan placed underneath the peristaltic pump and a thermoregulated box with a transparent door enclosing the sample introduction system.

4. Sample processing system according to claim 3, wherein the control  
30 means comprise thermo-controllers for regulating the heating wire and the thermoregulated box, and a thermosensor positioned on the pump controller box for regulating the heating fan.

5. Sample processing system according to claim 4, wherein the thermoregulated box is a Delrin® box.

35 6. Sample processing system according to claim 3, wherein the insulating

means comprise an insulating ribbed Teflon® tube sheathing the transfer tube and the heating wire, and an insulating box enclosing the peristaltic pump, the heating fan and the thermoregulated box.

5 7. Sample processing system according to claim 3, wherein the control sensors comprise thermocouples for measuring the temperatures inside the insulating means sheathing the transfer tube and the thermoregulated box, and a sensor located under the peristaltic pump body for measuring the temperature next to the first and second pump tubings.

10 8. Sample processing system according to claim 2, wherein the control means for regulating the temperature enable to select the temperature of each constituting part of the sample processing system according to the physical properties of the sample to analyse.

15 9. Sample processing system according to claim to 8, wherein the sample processing system is thermoregulated at temperatures above 50°C in order to avoid any sediment inside the sample holder, the transfer tube and the tubings of the peristaltic pump.

20 10. Sample processing system according to claim 1, wherein the means for collecting the sample from the tubes comprise a stainless steel guide for a sample probe and a sample probe holder.

25 11. Sample processing system according to claim 1, wherein the internal diameter  $\phi'$  of the second pump tubing is higher than the internal diameter  $\phi$  of the first pump tubing.

12. Sample processing system according to claim 1, wherein the material constituting the first and second tubing of the peristaltic pump is both heat and solvent resistant.